



Of Lizards, Oil & Velcro

By Lorne Fitch

Reprinted with permission, and minor updates, from *Wild Lands Advocate* (March 1993), the quarterly newsletter of the Alberta Wilderness Association.

"All creatures great and small"-- unfortunately, James Herriot coined the phrase first (to describe his veterinary adventures in Britain) but it is not a bad description of the mandate of Fish and Wildlife Services, Alberta Environmental Protection. It is easy to understand the focus on creatures like elk, bighorn sheep, deer, walleye and rainbow trout -- these are species in demand for hunting, fishing or viewing. There are other critters though, like long-toed salamanders and plains

spadefoot toads, that don't seem to fall into the "useful" category. Why spend time, money and energy on something you rarely encounter? The answer is found in the words of Aldo Leopold: "The first rule of intelligent tinkering is don't throw away any of the pieces."

All species in Alberta fit into an intricate web, a web we barely understand. It would be wise and prudent to maintain the web, if not for the intrinsic value of the species and their habitats, then for our own survival. The diminutive short-horned lizard is one of those "pieces" Aldo Leopold talked about keeping.

(continued on page 6)

Mailing List Update

Anyone who is not a volunteer steward and would like to receive *The Steward*, please fill out the form on the back of the newsletter and send it to us (volunteers will continue to receive this newsletter). By sending *The Steward* only to the people that want it, we can conserve paper. Thank you for your cooperation.

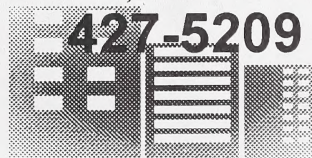
Weed Survey Reminder

When returning your field report for this year, please remember to return the weed survey that was in the Natural Areas conference folder. These surveys will provide land managers with an idea of the kind of weed problems that may exist on public lands and valuable information to deal with these problems. Thank you.

We've Moved

Natural Areas Branch
10405 Jasper Avenue
8th Floor, Standard Life Building
Edmonton, Alberta T5J 3N4

427-5209



Canadian Council on Ecological Areas Conference

by Kyle Clifford

On August 11-15, 1993, I attended the 12th Annual General Meeting and Conference of the Canadian Council on Ecological Areas in Windsor, Ontario. The Canadian Council on Ecological Areas (CCEA) is an incorporated, nonprofit, independent, national forum that was established in 1982 to encourage the selection, protection and stewardship of a comprehensive system of ecological areas in Canada. It draws its membership from federal, provincial and territorial government departments, nongovernment organizations, universities and private citizens.

The conference sessions began on August 12 with a presentation by the CCEA Acting Chairman, Al Davidson. He talked about biodiversity and the fact that diversity is often greatest in areas of Canada that are most heavily developed and inhabited. He also focused on the conference theme: the need to preserve the islands of natural landscapes that remain in the settled areas of Canada.

The new Minister of Natural Resources for the Province of Ontario, Honourable Howard Hampton discussed Ontario's changing Department of Natural Resources, focusing on the need for partnership and cooperative approaches. He also talked about habitat and ownership fragmentation of land and proposed a

park commission or a Crown corporation to oversee these issues.

Monte Hummel, who is also one of the founding members of the CCEA, was the third speaker. Monte defended the Endangered Spaces campaign, describing the goal of establishing a network of natural areas representing the diversity of the country -- not specifically the "12 percent solution." He confirmed that the Endangered Spaces campaign is now a matter of public policy in Canada. Monte said the concern that land classification systems (i.e., natural regions, ecoregions) do not meet at provincial borders is not a priority, and we should not wait to analyze our current status based on future potential classification systems. Although criteria for protection are different from criteria for representation, said Monte, the two can meld.

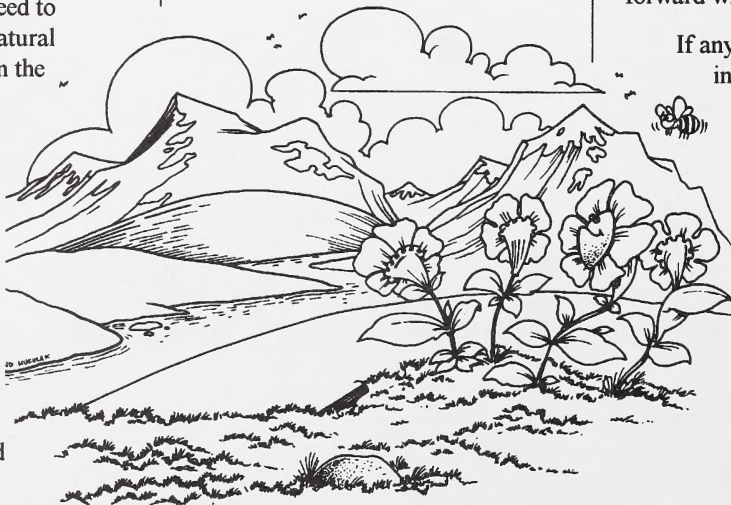
On the second day of the conference, three concurrent sessions were held: 1) Coping with Ecological Representation; 2) Exploring Protection Mechanisms; and 3) Ecological Integrity and Management.

Day three of the conference included a field trip to Rondeau Provincial Park and Point Pelee National Park. The wildlife management practices at these two parks were most interesting, particularly the way they are dealing with the large white-tailed deer population at Rondeau Provincial Park. The estimated deer population, which is approximately four times the sustainable number, is having a dramatic impact on the native vegetation in the park.

On day four, government and non-government representatives across Canada summarized the activities within their province in order to move forward with a protected area agenda.

If anyone is interested in further information about the Canadian Council on Ecological areas, you can write the following:

Secretariat
Canadian Council on
Ecological Areas
c/o Canadian Wildlife
Service
Environment Canada
Ottawa, Ontario
K1A 0H3



"CONSERVATION IS OFTEN PRESENTED AS IF IT REPRESENTED A CLINGING TO THE PAST: NOT SO, WHAT WE ARE ENGAGED IN PRESERVING IS OPPORTUNITIES FOR THE FUTURE."

An Introduction to Wetland Classification and Ecology

by J. Derek Johnson

(continued from Summer 1993)

Importance and Function of Wetlands

Hydrology

Wetlands help to control and store surface water, and so reduce the risk of flooding, soil loss and downstream sedimentation. By recharging and discharging groundwater, wetlands help to maintain water table levels. Wetlands also provide natural shoreline protection from wave action and erosion.

Ecology

Healthy wetlands are part of the overall biological diversity. They serve as a refuge for rare and endangered species. They provide food, shelter and breeding sites for many animals. Forty-five species of waterfowl, between 80 and 100 species of other birds, and 30 species of mammals use wetlands or wetland margins for all or part of their life cycle. This doesn't even begin to

Forty-five species of waterfowl, between 80 and 100 species of other birds, and 30 species of mammals use wetlands or wetland margins for all or part of their life cycle.

address the importance of wetlands to fish, amphibians, reptiles and invertebrates. The amount of organic carbon stored in peatlands is immense. Canada has 30 percent of the world's peat reserves. In Alberta, there is an estimated $2.7 \times 10^{11} \text{ m}^3$ of peat by volume or 2.67×10^9 tonnes of dry peat by weight. Wetlands provide

nutrients to downstream-connected waters. Wetlands act to naturally retain toxic substances, such as heavy metals and pesticides, thereby improving soil and water quality.

Agriculture

The native grasses and sedges found in wetlands are grazed or cut for hay. In dry years, they may provide the only available forage for livestock. Wetlands help to reduce topsoil erosion and improve soil moisture. They provide an on-farm water supply for livestock and domestic use. The growing of wild rice in natural wetlands is worth \$7 million annually to the Canadian economy. Berries and market garden crops produced on "managed" (=drained) wetlands infuse \$100 million into the Canadian economy annually.

Subsistence and Commercial Hunting, Trapping and Fishing

Hunting and trapping associated with wetlands is estimated to bring \$50-70 million per year into the Canadian economy. The commercial freshwater fishery adds another \$22 million and fish farming adds a further \$2-3 million.

Peat Resource

- horticultural peat.
- fuel peat. Limited consideration in Alberta as petroleum products are still relatively cheap and there are concerns about rehabilitating peatlands once they have been mined out.
- peat for industrial absorbents.
- timber production/forestry.

Recreation and Tourism

Both consumptive and non-consumptive uses of wetlands.

- hunting/fishing
- boating/canoeing
- cross-country skiing/skating
- birdwatching
- photography
- sightseeing
- nature appreciation in general

Scientific Research and Education

Wetlands provide excellent outdoor laboratories for learning about ecosystem structure and function. They are useful for demonstrating and studying ecological principles such as energy flow, biodiversity, nutrient cycling, and carrying capacity. And, since many wetlands have been highly modified by man, they provide excellent examples of environmental problems resulting from human disturbance.

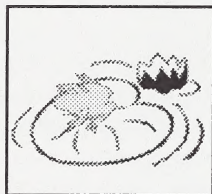
The economic returns derived from wetlands are estimated to be between \$5-10 billion annually in Canada, \$3 billion of which is from nonconsumptive recreational use.



Threats to Wetlands

Agriculture

Agriculture has accounted for 85 percent of the total known conversions of wetlands to other uses. The most serious wetland losses have been the marshes (sloughs) of central and southern Alberta. The boreal forest wetlands are still in relatively good shape, although they are facing increasing threats from hydroelectric developments, peat extraction, and forestry. Over 70 percent of the prairie wetlands have been converted to other uses; for the aspen parkland region the figure is over 60 percent. Eighty percent of the wetlands surrounding Calgary and Edmonton have been lost to agriculture and urban expansion since the time of settlement. Ninety percent of the wetlands in the prairie/



parkland area have been affected to some extent by agricultural activities. An estimated total of 1.2×10^6 ha of wetland have been converted to agriculture in the prairie/parkland region. One half of one percent of Alberta's wetlands are lost to agricultural drainage each year. Currently, less than 0.2 percent of all of Canada's wetlands lie within 40 km of our 23 largest metropolitan areas.

Drainage of wetlands is attractive to many agricultural producers. Subsidies and tax incentives for drainage have been available and there has been social pressure to drain wetlands. Such drainage is viewed as a way to bring more land into production. It improves the efficiency and timing of field operations. It reduces waterfowl damage to crops. It allows earlier

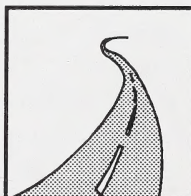
access to land in the spring. It allows cultivation and seeding of all areas at the same time. And it prevents waterlogging of crops after summer storms. However, these advantages ignore the loss of habitat for wildlife or problems associated with increased soil salinity following drainage. Clearing of wetland margins decreases the wetland size and depth by restricting snow accumulation, and promotes eventual basin-filling by increased water erosion and siltation resulting from tillage of the margins.

The costs and benefits of wetland drainage and retention are distributed unevenly among landowners and society as a whole.

The direct costs of wetland retention fall primarily on the landowner, while the benefits of wetland retention are societal in nature. Programs offered by government departments and various nongovernment organizations often appear to conflict in purpose with respect to wetlands. Some government programs promote drainage, and others support wetland preservation. Farming activity continues to move to less productive marginal lands, including wetlands, with little or no cost-benefit analysis being done to support the practice. Governments continue to subsidize uneconomical drainage programs with negative environmental consequences. Albertans are generally unaware of the many benefits of wetlands and are often unaware or indifferent to the loss and degradation of wetlands that result from human activities.

Urban Expansion

Nine percent of all wetland conversions in Alberta have been as a result of urban



expansion, to provide land for building or to eliminate places for mosquitoes to breed.

Road Construction

Road construction results in a direct loss of wetlands through infilling, but it also results in indirect loss of wetlands through the alteration of natural drainage patterns.

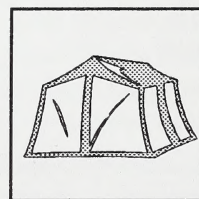
Oil And Gas Activity

Seismic lines, access roads and well-sites are infrastructures of the oil and gas industry.

Forest Land Drainage

Forested land is drained for commercial peat harvesting and improved timber production.

In total, 47 000 tonnes of peat are harvested annually in Alberta, worth almost \$7 million in an industry that exceeds \$47 million in revenue annually in Canada. Approximately 4 million ha or about 30 percent of Alberta's wetlands are considered potentially drainable for forestry purposes. Only about 1000 ha have been drained for this purpose so far. It is unlikely that this activity will increase much in the near future because the returns from forest land drainage do not currently justify the costs.



Recreational Developments

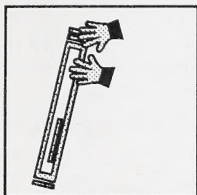
Recreation can be an incompatible land use in some wetlands. The construction of condominiums, marinas, and bathing beaches often destroys the very features that drew people to the area in the first place.

Pollution

Wetlands are often degraded by water contamination, siltation, channelization, or transformation into landfill sites.

Water Level Management

Hydroelectric developments, dams, weirs, and transmission lines all affect wetlands negatively.



Wetland Survey Methods

The vegetation in wetlands can be sampled in the same way as upland vegetation, except that if plot sampling is conducted, the plots generally have to be smaller than in upland sites so that the subtle differences in vegetation composition over very slight rises in elevation are not obscured.

Sampling of the peat profile is often done using a Macaulay sampler. This device is pushed into the peat by hand and gives a 4-cm diameter semicircular core about 50 cm long with each extraction. Samples from these peat cores are analyzed chemically to

determine the nutrient status of the peat. The micro-fossils and pollen found in the peat are studied to characterize the peatland in terms of its past and present vegetation composition. This analysis makes it possible to determine how these peatlands have changed over time.

Peatlands create their own environment. Upon reaching a critical thickness, accumulated peat can bring about a drastic change in the chemistry and nutrient levels of the peat. Such changes allow the invasion of different peat-forming vegetation, changing the complexion of the peatland. The total age of the peatland and the approximate rate of peat accumulation are determined through radiocarbon dating.

Indicators of Ecological Health in Wetland Habitats

Species richness and diversity are two of the best indicators of ecological health in wetland habitats. Declines in these components indicate deteriorating conditions in the wetland. The

invasion of non-native species is also an indicator of declining wetland health. The presence or absence of certain "keystone" species provides a quick indication of ecological health. In the case of wetlands, changes in the cover and/or abundance of the aquatic macrophytes, insectivorous plants, shallowly rooted species, and mosses provide the most readily observable indications of changes in wetland health. ▴

References

- Alberta Water Resources Commission. 1987. Drainage Potential in Alberta: An Integrated Study. Edmonton, Alberta. 163 pp.
- Environment Canada. 1986. Wetlands in Canada: A Valuable Resource. Lands Directorate, Environment Canada Fact Sheet 86-4. Ottawa, Ontario. 8 pp.
- Environment Canada. 1991. The Federal Policy on Wetland Conservation. Canadian Wildlife Service, Environment Canada, Ottawa, Ontario. 14 pp.
- National Wetlands Working Group. 1988. Wetlands of Canada. Ecological Land Classification Series, No. 24. Sustainable Development Branch, Environment Canada, Ottawa, Ontario, and Polyscience Publications Inc., Montreal, Quebec. 452 pp.



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(continued from page 1)

A good portion of the life history of the short-horned lizard has been uncovered by Larry Powell, a researcher from the University of Calgary. Unlike many other lizard species, the young of this group are born alive, an adaptation to living at the northern extreme of its range. Short-horned lizards are opportunistic feeders, subsisting on ants and other small insects.

Their habitat is the arid mixed grass prairie of southeastern Alberta, where they form localized and isolated populations. This disjunct distribution is of concern since a local population could be easily extirpated by several types of land use activity.

The size of the lizard population in Alberta is unknown -- some evidence suggests a stable, but small, population while other data indicate that populations have shrunk considerably over the last decade. Research efforts have not progressed long enough to indicate any cyclical phenomena in populations, which might explain the uncertainty over population sizes. As a result of this uncertainty, Fish and Wildlife Services has put short-horned lizards on the Red List, an indication that the species is in serious trouble and should be designated as "Endangered."

The red flagging of short-horned lizards has provided Fish and Wildlife Services with some ammunition to approach potential land use activity in their habitat differently. Although most short-horned lizard habitats are grazed by cattle, this activity seems quite benign. Petroleum exploration and development appear to be the activities with the most potential to harm populations or disturb habitat

crucial to their survival. Wellsites, geophysical trails, access roads, pipelines and the increased vehicle activity brought on by development can have a negative impact on a creature that resides in a limited area.


The problem in making the correct decisions (for the lizards) on locations for petroleum activity has been understanding their habitat requirements. Earlier research by Larry Powell provided a generic picture of habitats where short-horned lizards were captured. The leap from where a creature is captured to an understanding of the total habitat picture is long and fraught with uncertainty. In addition, no information is available on what short-horned lizards do in the winter; obviously they must hibernate, but where? It has been speculated that they use natural cavities, including crevices in rock outcrops, as hibernaculums to avoid freezing temperatures. Knowing where these spots are, or the type of spot most likely to be used, is a key component in addressing a land use referral for a wellsite, especially in January when no short-horned lizards can be found on the surface to indicate use of an area.

But how do you monitor the movements of a greyish-brown creature, barely an inch high, as it scurries through (and under) sage, juniper and grasslands stretching over the horizon? With the help of some funding from the Wildlife Enhancement Fund, radio telemetry became the answer. Tiny transmitters, about the size of your little fingernail, were used to allow the tracking of lizards. Securement of these transmitters to the lizards called for some unique innovations. Tiny strips of velcro were first glued (with surgical glue) to the lizard; an accompanying piece of velcro was then epoxied to the transmitter. That arrangement allowed lizards, if they

became snagged on vegetation or when accessing a hibernaculum, to wriggle free. In practice, the arrangement worked relatively well, but it became apparent that simply gluing the transmitter to the lizards was a more workable solution. The movements of 10 radio "collared" lizards were followed, virtually on a daily basis, from August 15 to September 18, 1992, at which point the batteries in the transmitters began to fail.

The results confirmed some suspicions about short-horned lizard ecology and provided us with information about habits and habitat. They spend their lives within an area about 60 m in diameter. The size of this home range is key to understanding the implications of a wellsite normally 100m by 100 m; that's roughly four lizard home ranges.

A late August snowfall produced some interesting reactions -- lizards literally "hunkered down" in dense grass cover or under thick sage and sat out the cold weather. This early snowfall may have "readjusted" the internal clock that signals a move to hibernation, as lizards remained active much later in the season than ever previously observed. Unfortunately they were active long after the transmitter batteries began to fail, so we have not uncovered the secret of where they go in the winter yet.

Armed with the new information on home range size and habitats used, we can make more intelligent guesses about short-horned lizard use over the rest of their range. This information will allow us to better assess and integrate land use activities, the goal being to maintain lizard populations and habitat. As one of the unique "pieces" of Alberta's fauna, short-horned lizards deserve the effort. I suspect Aldo Leopold would be pleased. 

Volunteer Steward Annual Report

Status of Volunteer Steward Program: 1992-93

Number of volunteer stewards:

Individuals	162
Groups	61
Total	223

Number of sites with stewards:

Order in Council	96
Candidate	66
Total	162

Number of Natural Areas:

Order in Council	123
Candidate	155
Total	278

The 1992-93 Volunteer Steward Annual Report is now available. If you would like a copy, please write to:

Natural Areas Branch
10405 Jasper Avenue
8th Floor, Standard Life Building
Edmonton, Alberta
T5J 3N4

Number of sites with:

One steward	93
More than one steward	62
A volunteer management committee	7

Number of Natural Areas available for the steward program:

Order in Council	120
Reserved	96
Total	216

Number of sites without stewards:

Number of sites not available:

Order in Council	3
Reserved	59
Total	62

Volunteer Steward Conference

If you forgot to turn in your name tags from the Volunteer Steward Conference, please send them to:

Red Deer River Naturalists
Box 785
Red Deer, Alberta
T4N 5H4

Site Activities

July 1, 1993 to Oct. 23, 1993

A regular feature to keep volunteer stewards and interested individuals informed of activities occurring on our sites.

Bear River:

- seismic program approved subject to no new cutting and using existing cutlines

Bellis North:

- proposed seismic program rejected

Beta Lake:

- request for local timber permit rejected

Carnwood-Modeste:

- fire reported

Cardinal Divide:

- Coal Branch Access Management Plan reviewed

Clifford E. Lee:

- purple loosestrife reported and hand-picked from wetland just to west of site

Clouston Creek:

- new site proposed; Natural Area reservation application

Cow Lake:

- vegetation monitoring program established for water stabilization

Crowsnest:

- brush control for power line completed; heli-portable and hand-cut seismic program approved

Eagle Creek:

- miscellaneous lease for guide and outfitting camp approved

Easyford:

- seismic program on existing lines and during frozen-ground period approved

Edson West:

- proposed pipeline, adjacent to existing pipeline, approved

George Lake Area:

- Municipal District of Westlock has proposed a no discharge of firearms bylaw

Fourth Creek:

- open house held to review management plan

Garner Fen:

- received a proposal to add lands

Halfmoon Lake:

- Municipal District of Westlock has proposed a no discharge of firearms bylaw

Halfway Lake:

- proposed seismic program rejected; Municipal District of Westlock has proposed a no discharge of firearms bylaw

Holmes Crossing:

- land exchange rejected

Hubert Lake:

- application for Natural Area reservation on a 1560-ha site

Landslide Lake:

- complaint received about tourist helicopter access

Little Smoky-Iosegun:

- Alberta Transportation and Utilities upgraded trail through site to access gravel deposit (outside site)

Manly Corner:

- proposed seismic program on existing cutlines approved

Medicine Lodge Hills:

- proposed pipeline approved

Modeste-Saskatchewan:

- miscellaneous lease for gravel stockpile site renewed

Nestow:

- Municipal District of Westlock has proposed a no discharge of firearms bylaw

Noel Lake:

- 32 ha added to Natural Area reservation

North Cooking Lake:

- trail improvements completed, including new trail spur to future bird observation blind; final version of interpretive plan received; Salisbury Composite High School to conduct vegetation studies

Ole Buck Mountain:

- reservation application to add 3.7 ha to site

Site Activities

July 1, 1993 to Oct. 23, 1993

Pine Sands:

- new trails to be constructed by Alberta Transportation and Utilities

Poplar Creek:

- application for wellsite received; inspection completed of possible addition to site

Prairie Coulee Proposed Ecological Reserve:

- first meeting of Management Advisory Committee held

Prefontaine-Brock Lakes:

- hand-cut seismic lines approved

Riverlot 56:

- weed control (mowing) of field scabious and Canada thistle completed

Saskatoon Mountain:

- held open house, hosted by Archaeological Survey, 600 in attendance; miscellaneous lease for repeater station approved

Spruce Island Lake:

- proposed seismic program approved; Municipal District of Westlock has proposed a no discharge of firearms bylaw

Strawberry Creek:

- brush control of power line, by hydroaxe approved

Sundre-Red Deer River:

- disposition reservation for Environment amended; Natural Area reservation on 46.5 ha cancelled

Tawatinaw:

- two proposed seismic programs approved subject to no new cutting, and no vehicles; Municipal District of Westlock has proposed a no discharge of firearms bylaw

Telfordville:

- weed control (hand-picking) of scentless chamomile completed; off-highway vehicle abuse of site reported; signs installed and subsequently stolen

Wagner:

- boardwalk sections repaired

Wahstao:

- hand-cut seismic lines approved

Wainwright Dunes Ecological Reserve:

- report on comparison of vegetation and disturbances between 1963 and 1990 received; draft management plan reviewed

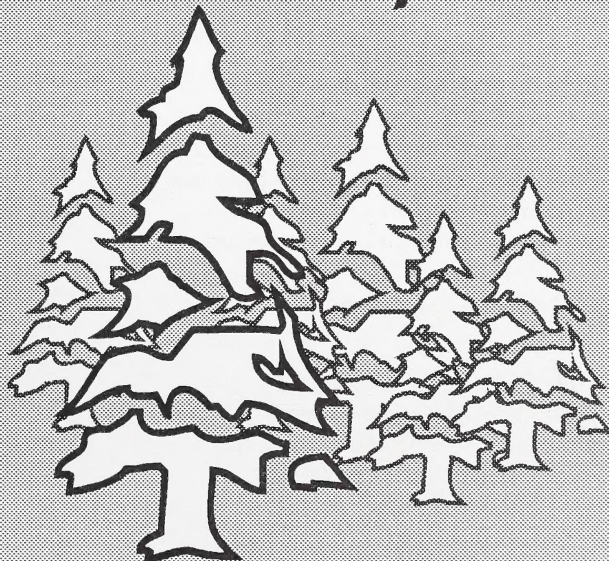
West Bow Flats:

- water control/stabilization project to control dust from Lac des Arcs reviewed

Whitcourt Mountain:

- miscellaneous lease for communications tower approved

Season 's Greetings



Return Address:
Natural Areas Branch
10405 Jasper Avenue
8th Floor, Standard Life Building
T5J 3N4

If you are **NOT** a Volunteer Steward...
Read this!

Yes! Please mail *The Steward* to me...I would like to continue to receive *The Steward* or be added to your mailing list.

Name: _____

Address: _____

Please mail to our address above. Thank you.

Coming Events

December 18; Strathcona Natural History Club, 1993

- Join us for an informal Christmas bird count at the Sherwood Park Natural Area. This one won't count for the international survey but instead is a chance for you to see what is involved in a "real" bird count and also look for species of birds which overwinter in one of our favourite areas. For more information, please contact Cathy Bernier at 464-3823.

January 13, 1994; Conference on Private Conservancy

- Plan to attend this one-day event on private conservancy issues. Through private conservancy, private land is set aside forever for conservation purposes. The Environmental Law Centre's one-day conference is an opportunity to find out more about private conservancy

Coming Events

(Continued)

January 13, 1994; Conference on Private Conservancy (continued)

including the current legal requirements, implications, and advantages and limitations of private conservancy.

- For more information:
Environmental Law Centre
Telephone: (403) 482-4891
Alberta Toll Free: 1-800-661-4238

February 26, 1994; 7th Annual Alberta Native Plant Council Annual Workshop: Reclamation and Revegetation -- Towards Restoring Ecosystems

- Join us from 8:30 a.m. to 4:30 p.m. at the University of Alberta for this annual workshop. Topics will include the following:
 - Producing native plants (talk by Manitoba's John Morgan, Canada's largest producer of tallgrass prairie plants)
 - How native is native?
 - Criteria for success
 - Botanical bullies: managing weeds
- For more information call Anne Smreciu at 461-5950.

May 16-20, 1994; Ecosystem Monitoring and Protected Areas

Second International Conference on Science and the Management of Protected Areas Dalhousie University, Halifax, Nova Scotia

- The conference will consider the science and management of whole-system monitoring in both terrestrial and marine environments. Information may be obtained from Mr. Neil Munro, Parks Canada, Historic Properties, Upper Water Street, Halifax, Nova Scotia, B3J 1S9 or by FAX (902) 426-7012.

Oops! The last two pages of this issue are blank due to the printer's error. Our apologies.

